

What is claimed is:

- 1           1.       A nucleic acid molecule encoding a fusion protein comprising:
  - 2                   (a)     a signal sequence;
  - 3                   (b)     an immunoglobulin Fc region; and
  - 4                   (c)     a target protein sequence comprising interferon-alpha,
  - 5                   wherein the signal sequence, the immunoglobulin Fc region and the target protein
  - 6                   sequence are encoded serially in a 5' to 3' direction.
- 1           2.       The nucleic acid of claim 1 wherein the immunoglobulin Fc region
- 2                   comprises an immunoglobulin hinge region.
- 1           3.       The nucleic acid of claim 1 wherein the immunoglobulin Fc region
- 2                   comprises an immunoglobulin hinge region and an immunoglobulin heavy chain constant
- 3                   region domain.
- 1           4.       The nucleic acid of claim 1 wherein the immunoglobulin Fc region
- 2                   comprises an immunoglobulin hinge region and an immunoglobulin CH3 domain.
- 1           5.       The nucleic acid of claim 1, wherein the immunoglobulin Fc region
- 2                   comprises a hinge region, a CH2 domain and a CH3 domain.
- 1           6.       The nucleic acid of claim 5 wherein the immunoglobulin Fc region
- 2                   comprises a portion of an immunoglobulin gamma sequence.
- 1           7.       The nucleic acid of claim 6 wherein the immunoglobulin gamma is human
- 2                   immunoglobulin gamma1.
- 1           8.       A replicable expression vector for transfecting a mammalian cell, the
- 2                   vector comprising the nucleic acid of claim 1.

3 (b) culturing the mammalian cell to produce the fusion protein.

1 21. The method of claim 20 comprising the additional step of collecting the  
2 fusion protein.

1 22. The method of claim 20 comprising the additional step of purifying the  
2 fusion protein.

1 23. The method of claim 20 comprising the additional step of cleaving with a  
2 proteolytic enzyme the immunoglobulin Fc region from the target protein at a proteolytic  
3 cleavage site disposed between the immunoglobulin Fc region and the target protein.

1 24. A method of treating a condition alleviated by the administration of  
2 interferon-alpha comprising the step of administering the nucleic acid of claim 1 to a  
3 mammal having the condition.

1 25. A method of treating a condition alleviated by the administration of  
2 interferon-alpha comprising the step of administering the vector of claim 8 to a mammal  
3 having the condition.

1 26. A method of treating a condition alleviated by the administration of  
2 interferon-alpha comprising the step of administering the fusion protein of claim 11 to a  
3 mammal having the condition.

1 27. A method of treating a condition alleviated by the administration of  
2 interferon-alpha comprising the step of administering protein of claim 18 to a mammal  
3 having the condition.

1 28. The method of claim 26 wherein the condition is a liver disorder.

1 29. The method of claim 28 wherein the liver disorder is hepatitis.

- 1           9.       The replicable expression vector of claim 8 wherein the vector is a viral  
2   vector.
- 1           10.      A mammalian cell harboring the nucleic acid of claim 1.
- 1           11.      A fusion protein comprising in an amino terminal to carboxy terminal  
2   direction an immunoglobulin Fc region and a target protein comprising interferon-alpha.
- 1           12.      The fusion protein of claim 11 wherein the interferon-alpha comprises an  
2   amino acid sequence set forth in SEQ. ID. NO.: 2, 7 or 8-21 or a species or allelic variant  
3   thereof.
- 1           13.      The fusion protein of claim 11 wherein the target protein comprises at  
2   least two interferon-alpha molecules linked by a polypeptide linker.
- 1           14.      The fusion protein of claim 13 further comprising a polypeptide linker  
2   linking the immunoglobulin Fc region to the target protein.
- 1           15.      The fusion protein of claim 11 wherein the immunoglobulin Fc region  
2   comprises an immunoglobulin hinge region and an immunoglobulin heavy chain constant  
3   region domain.
- 1           16.      The fusion protein of claim 15 wherein the heavy chain constant region  
2   domain comprises a CH3 domain.
- 1           17.      The fusion protein of claim 11 wherein the immunoglobulin Fc region  
2   comprises a hinge region, a CH2 domain and a CH3 domain.
- 1           18.      A multimeric protein comprising at least two fusion proteins of claim 11  
2   linked via a covalent bond.
- 1           19.      The protein of claim 18 wherein the covalent bond is a disulfide bond.
- 1           20.      A method of producing a fusion protein comprising the steps of:  
2               (a)     providing the mammalian cell of claim 10; and